

CLAIMS

1. An infusion fluid warming method of warming an infusion fluid to a predetermined temperature prior to supply of the infusion fluid into a living body, the method being characterized in that:

a latent-heat-type heat accumulator member is disposed in the vicinity of the infusion fluid, and the infusion fluid is warmed by using a latent heat generated in phase change of the heat accumulator member from liquid phase to solid phase.

2. An infusion fluid warming apparatus for warming an infusion fluid to a predetermined temperature prior to supply of the infusion fluid into a living body through an infusion fluid tube, the apparatus being characterized by including:

a tube holding device detachably holding the infusion fluid tube; and

a latent-heat-type heat accumulator member which is disposed in the tube holding device, and which warms the infusion fluid passing through the infusion fluid tube that is held by the tube holding device, by a latent heat generated in phase change of the heat accumulator member from liquid phase to solid phase.

3. The infusion fluid warming apparatus according to claim 2, wherein the latent-heat-type heat accumulator member is constituted by any one of paraffin-based heat accumulating material, salt-hydrate-based heat accumulating material and clathrate-hydrate-based heat accumulating material.

4. The infusion fluid warming apparatus according to claim 2 or 3, wherein the latent-heat-type heat accumulator member is constituted by a heat accumulating material which has a characteristic that the material is held in the liquid phase even at a temperature lower than a melting point of the material and is changed from the liquid phase to the solid phase in response to stimulus.

5. The infusion fluid warming apparatus according to

claim 4, wherein the latent-heat-type heat accumulator member is constituted by the heat accumulating material, a trigger member which initiates the phase change of the heat accumulating material from the liquid phase to the solid phase in response to a heat generation initiating operation, and a flexible accommodating bag which fluid-tightly accommodates the heat accumulating material and the trigger member.

6. The infusion fluid warming apparatus according to any one of claims 2-5, wherein the tube holding device has a tube holding member holding the infusion fluid tube in a predetermined curved shape, and wherein the accommodating bag is detachably held in close contact directly or indirectly with the tube holding member.

7. The infusion fluid warming apparatus according to claim 6, wherein the accommodating bag is constituted by a flexible sheet, and has a heat conducting fin including an end portion connected to a portion of the flexible sheet that is in close contact with the tube holding member, and another end portion separated from the portion of the flexible sheet.

8. The infusion fluid warming apparatus according to any one of claims 2-7, wherein the tube holding device has an electric heater for heating the latent-heat-type heat accumulator member so as to cause the phase change of the heat accumulator member from the solid phase to the liquid phase.

9. An infusion fluid warming bag which is to be disposed in the vicinity of an infusion fluid, for warming the infusion fluid to a predetermined temperature prior to supply of the infusion fluid into a living body, the infusion fluid warming bag being characterized by including:

a bag-shaped main body; and

a heat accumulating material which is accommodated in the bag-shaped main body and which generates a latent heat in phase change of the material from liquid phase to solid phase.,

10. The infusion fluid warming bag according to claim 9,

wherein the bag-shaped main body has an outer bag constituted by a flexible sheet, and a heat conducting member including a portion held in contact with a warming surface of the flexible sheet that is to be opposed to the infusion fluid and another portion separated from the warming surface of the flexible sheet.

11. The infusion fluid warming bag according to claim 10, wherein the heat conducting member is provided by a plurality of heat conducting fins each including an end portion connected to the warming surface of the flexible sheet that is to be opposed to the infusion fluid and another end portion separated from the warming surface of the flexible sheet.

12. The infusion fluid warming bag according to claim 10 or 11, wherein the flexible sheet is a composite sheet including metal and resin layers that are superposed on each other.